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EXAMINER

JOLLEY, KIRSTEN

ART UNIT

PAPER NUMBER

1762

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/308,770

Applicant(s)

SCHWERTFEGER, FRITZ

Examiner

Kirsten C Jolley

Art Unit

1762

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 6-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19 and 23 is/are allowed.
- 6) ☒ Claim(s) 1, 6-18, 20-22 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Due to Applicant's amendments to claim 1, the claims are now rejected under 35 USC 103(a) over Lentz in view of WO 96/06809. WO '809 is the PCT publication of Frank et al. (US 5,866,027) which was applied in the prior Office actions.
2. Applicant's arguments filed March 17, 2004 have been fully considered but they are not persuasive.

Applicant argues that Lentz states "it is essential that the sol be heated at a temperature of from 50 to 250°C with sufficient strong mineral acid so that the pH of the sol during heating is one or less," and because claim 1 requires that a base is used to form the gel, the solution will not be at a pH of "one or less" as required by Lentz. Applicant states that there is nothing in Lentz or Frank et al. that would teach or suggest that this process should take place at a pH of greater than 1.

The Examiner notes that the cited step of heating the sol with strong mineral acid such that the pH during heating is one or less is the first process step of Lentz's invention, after the silica hydrosol is provided. Lentz teaches that the silica hydrosol is provided in col. 2, lines 26-34, *and then* the silica hydrosol is heated with acid as taught in col. 2, lines 35-50. Lentz is combined with WO 96/06809 (Frank et al.) for WO '809's teaching of a conventional method of making a silica hydrosol. Lentz teaches that any silica hydrosol may be used in its invention, and the method employed to prepare the sol is immaterial. WO '809 (Frank et al.) discloses a known method for making a silica hydrosol including the steps of bringing an aqueous water

Art Unit: 1762

glass solution to a pH value of ≤ 3 and polycondensing via addition of a base. Therefore, while it is acknowledged that Lentz teaches heating in the presence of a strong acid, this step is in addition to (after) the claimed step of preparing a lyogel. Applicants' use of broad "comprising" language in claim 1 does not exclude the presence of additional materials or process steps. The transitional term "comprising," which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 948) ("comprising" leaves "the claim open for the inclusion of unspecified ingredients even in major amounts").

Claim Objections

3. Claim 20 is objected to because of the following informalities: In claim 20, line 1, "claim 4 1" appears to contain a typographical error; it appears that "4" should be deleted since the claim was canceled. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 6-18, 20-22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lentz (US 3,122,520) as applied to claims 1-2, 9-15, 17, and 21-22 in view of WO 96/06809 A1.

Frank et al. (US 5,866,027) is used as a working English translation of WO 96/06809 A1.

Lentz is applied for the same reasons set forth in the prior Office actions. Lentz teaches a process comprising the steps of converting the hydrogel to an organogel, and mixing the hydrogel/organogel with an organosilicon compound to perform the hydrophobing reaction (col. 3, lines 15-65). Lentz teaches that the step of converting the hydrogel to an organogel may occur prior to, simultaneous with, or subsequent to the step of mixing with the organosilicon compound. Lentz specifically teaches at col. 3, lines 49-53, "The organic solvent can be added prior to, simultaneously with, or subsequent to the addition of the organosilicon compound. That is the silica hydrogel can be *first* converted into an organogel by *replacement of the water with an organic solvent* [emphasis added]." Lentz teaches a small group of organosilicon compounds that may be used to perform the hydrophobing reaction at col. 4, lines 11-27; this group includes hexaethyldisiloxane which meets Applicant's claimed disiloxane formula. Therefore, Lentz teaches performing its process of *first* washing the lyogel with an organic solvent to *replace* the water with organic solvent, followed by a step of hydrophobing using one of its preferred organosilicon compounds which includes hexaethyldisiloxane.

Alternatively, it is noted that Example 10 in col. 7 discloses a process whereby a hydrogel is washed with ethanol "to remove the water and then with methylene chloride to remove the alcohol and the resulting organogel is mixed with sufficient trimethylchlorosilane to give .08 trimethylsilyl group per SiO₂ unit in the gel..." (col. 7, lines 27-31). While it is noted

Art Unit: 1762

that this embodiment does not use a disiloxane having the claimed formula as the organosilicon compound, it is the Examiner's position that the Lentz reference would have suggested to one skilled in the art that any of the organosilicon compounds taught by Lentz in col. 4, lines 11-27, would have been suitable for use as the organosilicon compound in place of those compounds used in the specific examples. It would have been obvious for one having ordinary skill in the art to have substituted one of the organosilicon compounds taught in col. 4, such as hexaethyldisiloxane, for the organosilicon compound specifically used in Example 10 (trimethylchlorosilane) with the expectation of similar and successful results since Lentz teaches that the organosilicon compounds in col. 4 are "operative" in its invention.

With respect to the limitation that the lyogel is "essentially free of water" and claim 9, it is the Examiner's position that the organogel of Lentz is inherently free of water (which is necessarily less than 5 wt %) since Lentz teaches that the water is "removed" and the organic solvent "replaces" the water.

Lentz lacks a teaching of preparing a silicate-type hydrogel bringing an aqueous water glass solution to a pH value ≤ 3 with the aid of an acidic ion-exchanged resin or an inorganic acid to produce silicic acid and polycondensing the silicic acid via a base to give a silicate gel. Lentz teaches in col. 2, lines 26-29, that "*any silica hydrosol having from .02 to .5 g. of SiO₂ per ml. of sol can be employed. The method employed to prepare the sol is immaterial* [emphasis added]". One having ordinary skill in the art would have been motivated to look to the prior art for conventional methods for forming silicate-type hydrogels. WO '809 (Frank et al.) is cited to demonstrate a prior art method for producing a silicate hydrogel. See col. 4, steps a) and c) of Frank et al. which discloses the claimed method for making a silicate hydrogel. It would have

Art Unit: 1762

been obvious for one having ordinary skill in the art to have used a silica sol made by the method taught by WO '809 in the processing method of Lentz since Lentz specifically states that the starting material of silica hydrosol of its invention may be made by any method (and even mentions an exemplary method of deionizing sodium silicate using ion exchange resin) and WO '809 discloses an exemplary method of making silica hydrosol for use in a method similar to that of Lentz. The test of obviousness is not express suggestion of the claimed invention in any or all references but rather what the references taken collectively would suggest to those of ordinary skill in the art presumed to be familiar with them. *In re Rosselet*, 347 F.2d 847, 146 USPQ 183 (CCPA 1965); *In re Hedges*, 783 F.2d 1038.

Claims 10-12, 14-15, 17, and 21-22 are rejected for the same reasons discussed in the prior Office actions.

As to claims 6-8, 16, 18, 20, and 24, WO '809 (Frank et al.) additionally teaches known prior art steps of aging aerogels, increasing the mechanical stability of aerogels, and subcritical drying. It would have been obvious to have combined the teachings of WO '809 with the method of Lentz with the expectation of successful results since Lentz and WO '809 are similarly directed to the production of xerogels/aerogels using similar processing steps.

As to claim 13, it is noted that Lentz teaches using hexamethyldisiloxane as the organosilicon compound in Examples 1 and 2. While Lentz does not teach hexamethyldisiloxane as one of the preferred organosilicon compounds in col. 4, lines 13-27, it is the Examiner's position that it would have been obvious for one having ordinary skill in the art to have used hexamethyldisiloxane as the organosilicon compound in the embodiment discussed above (the embodiment demonstrated in Example 10) with the expectation of similar and

Art Unit: 1762

successful results since hexamethyldisiloxane is demonstrated as a useful hydrophobing agent in Examples 1 and 2, and since hexamethyldisiloxane is chemically materially similar to hexaethyldisiloxane which is taught as an operative organosilicon compound in col. 4 of Lentz.

Allowable Subject Matter

6. Claims 19 and 23 are allowed for the reasons discussed in the Office action mailed July 30, 2002.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P Beck can be reached on 571-272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Kirsten C Jolley

Application/Control Number: 09/308,770

Page 8

Art Unit: 1762

Patent Examiner
Art Unit 1762

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